

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) An antenna comprising:
an active face, at least one radiating element for transmitting radio frequency (RF) signals via the active face, and a metal free thermal control film covering the active face, the metal free thermal control film comprising:
a multi-layer interference filter having alternating higher and lower refractive index layers arranged to filter optical radiation based on interference effects between different components of the optical radiation produced by reflection at ~~the~~ boundaries between the layers, said control film exhibiting preselected high absorbency and emissive characteristics in ~~the~~ an infrared wavelength range between 2.5µm to 50µm and low absorbency characteristics in ~~the~~ a solar spectrum range between 200-2500nm 200nm to 2500nm to limit solar input and allow heat dissipated in the antenna to be radiated into space via the active face, the control film further exhibiting high transmissive characteristics in ~~the~~ a microwave frequency spectrum 1 to 30GHz to allow the RF signals to be transmitted via the active face.

2. - 3. (Cancelled)

4. (Previously Presented) The antenna according to claim 1, wherein the film is in the form of a flexible sheet.

5. (Canceled)

6. (Previously Presented) The antenna according to claim 1 wherein the multi-layer interference filter is a polymeric structure.

7. (Previously Presented) The antenna according to claim 1, wherein the multi-layer interference filter comprises one or more layers of any of combination of SiO_2 , SiO_xN_y , and Si_3N_4 .

8. (Previously Presented) The antenna according to claim 7, wherein the film is in the form of a plurality of tiles.

9. (Currently Amended) The antenna according to claim 1, wherein ~~[[the]]~~ a thickness of the film is less than 200 microns.

10. (Currently Amended) The antenna according to claim 1, wherein ~~[[the]]~~ a thickness of the film is in the range of 50 to 150 microns.

11.-13. (Cancelled)

14. (Previously Presented) The antenna according to claim 4 wherein the multi-layer interference filter is a polymeric structure.

15. (Previously Presented) The antenna according to claim 14, wherein the multi-layer interference filter comprises one or more layers of any of combination of SiO_2 , SiO_xN_y , and Si_3N_4 .

16. (Previously Presented) The antenna according to claim 15, wherein the film is in the form of a plurality of tiles.

17. (Currently Amended) The antenna according to claim 16, wherein the thickness of the film is less than 200 microns.

18. (Currently Amended) The antenna according to claim 17, wherein the thickness of the film is in ~~[[the]]~~ a range of 50 to 150 microns.

19.-20. (Canceled)

21. (Currently Amended) The antenna according to claim 1 wherein the film is formed by applying a liquid coating to a surface of ~~[[the]]~~ a spacecraft.

22. (Canceled)

23. (New) A spacecraft antenna comprising

an active face comprising at least one radiating element for transmitting radio frequency (RF) signals, and

a metal free thermal control film covering the active face, the metal free thermal control film comprising a multi-layer interference filter having alternating higher and lower refractive index layers arranged to filter optical radiation based on interference effects between different components of the optical radiation produced by reflection at boundaries between the layers, said control film exhibiting sufficiently high absorbency and emissive characteristics in an infrared wavelength range 2.5 μm to 50 μm and sufficiently low absorbency characteristics in a solar spectrum range 200nm to 2500nm to limit solar input and allow heat dissipated in the antenna to be radiated into space via the active face, the control film further exhibiting sufficiently high transmissive characteristics in a microwave frequency spectrum 1 to 30 GHz to allow through RF signals transmitted by said at least one radiating element.

24. (New) A spacecraft antenna comprising

an active face comprising at least one radiating element for transmitting radio frequency (RF) signals, and

a metal free thermal control film covering the active face, the metal free thermal control film comprising a multi-layer interference filter having alternating higher and lower refractive index layers arranged to filter optical radiation based on interference effects between different components of the optical radiation produced by reflection at boundaries between the layers, said control film being configured to

absorb and emit radiation in an infrared wavelength range $2.5\ \mu\text{m}$ to $50\ \mu\text{m}$ to dissipate waste heat produced by active components of the antenna into space via the active face, said control film being configured to reflect solar radiation to limit solar input via the active face, and, the control film further being configured to transmit radiation in a microwave frequency spectrum 1 to 30 GHz to allow through RF signals transmitted by said at least one radiating element.